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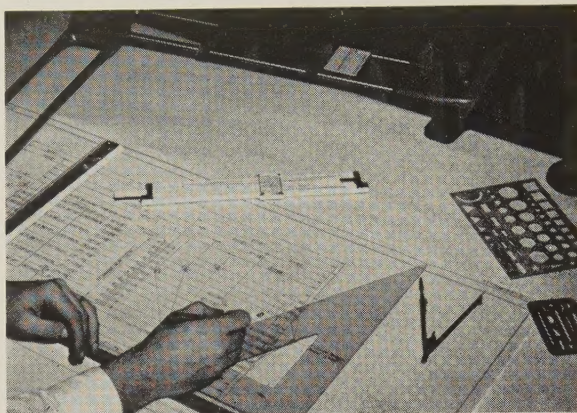


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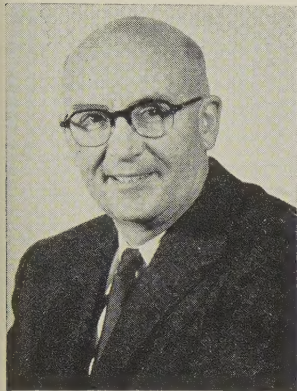
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Of Interest to I. S. P. E.

PRESIDENT'S MESSAGE

By ROYCE E. JOHNSON

The approach of the 72nd Annual Meeting and the end of a year of intensive service gives us a better understanding of how Secretary-Emeritus, Harold E. Babbitt, felt several years ago when he acquired Emeritus status after many years of devoted service. His self-control in abstaining from suggestions to the younger generation following his footsteps set an example which may not be easy to emulate.



Royce E. Johnson

This year has been an interesting one—never a dull moment, one might quip. Committee meetings, Chapter visits, correspondence, tele-

phone calls, Board of Direction meetings—all have helped time to pass rapidly. Throughout the year, as has been true other years also, your officers have had the reassuring feeling that dedicated members were actively pursuing committee and office opportunities for service at chapter and state levels which would spell accomplishment.

Our faith has been justified by results. We are sincerely grateful for such splendid results. We are also very appreciative for the many courtesies extended at Board meetings and during visits with Chapters and the opportunities to meet members and become better acquainted. Had it not been for the ability and efforts of members in key assignments your state officers would have been practically helpless. Ours is very obviously not a one-man organization when it comes to producing results.

For a day-dreaming experiment in visualizing an engineers' Utopia, consider the significant contributions this year on a per-worker basis. Imagine our potential accomplishments for our profession if twenty per cent of our members could be motivated each year to be as productive as were those who contributed greatly to the success of outstanding committee and chapter activities which first come to mind.

This analytical approach leads to the conclusion that a basic prerequisite for growth and success in professional societies as well as in industrial corporations is sufficient motivation of individuals to produce at a level commensurate with their ability.

(Continued Page 2)

VOX SECRETARII

By P. E. ROBERTS, *Executive Secretary*

Functional Sections

Interest in functional sections has been increasing in the Illinois Society for about three years. At the 72nd Annual Meeting just completed, Friday morning, April 12, was devoted to group discussions and organization of several functional sections. With the focus of attention on "special interests," a whole new field of activity is open to Illinois Society members. The net effect should be beneficial and lasting.

Membership

As the April issue goes to press, the magical plateau of 2,000 net members is still a myth. However, the totals reached the point where the figure will probably be recorded before the summer siesta sets in.

Reorganization

A year ago the governing body of the Society, the Board of Direction, was expanded to include multiple Chapter Representatives. This year a new expansion has taken place and the Society will have the benefit of the services, advice and energy of three Vice Presidents instead of one. The expansion seemed necessary to those who govern the Society, inasmuch as the increased interest in functional sections, Chapter activities, et cetera, increased the work of the officers to such an extent that they felt they needed help.

Miscellany

No trivia this month.

CONTENTS OF THIS ISSUE

	Page
President's Message.....	1
Vox Secretarii.....	1
Obituaries.....	2
Some Basic Industrial Trends and Their Economic Influence on the Bituminous Industry.....	3 to 8
News of the Chapters.....	9 and 11
Professional Directory.....	10

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SUBSCRIPTION RATES

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Lest these paragraphs be misconstrued as an indication of dissatisfaction with our progress we hasten to add that their purpose is only to motivate to even greater accomplishment which will measure up to our aggregate latent ability. Our objectives, as a society, can be elevated, as has been well demonstrated by past performance. Continued support through energetic member and chapter activities for new aims and objectives established by the Board of Direction and your state officers will enable ISPE to continually improve its usefulness in our rapidly changing age of science and technology.

The following intriguing description of how to persuade people to his way of thinking and salvation very aptly applies in our endeavors although John Bunyan wrote it nearly 300 years ago. Did it not border on sacrilege it could readily be paraphrased to refer more specifically to engineers.

"You see the ways the fisherman doth take
To catch the fish; what engines doth he make!
Behold! how he engageth all his units;
Also his snares, lines, angles, hooks and nets;
Yet fish there be, that neither hook, nor line,
Nor snare, nor net, nor engine can make thine;
They must be groped for, and be tickled too,
Or they will not be caught, whate'er you do."



Left to right: The late L. J. Keenan; Charles M. Roos; the Honorable Melvin Price, and St. Clair Chapter Vice President Melvin Dobbs. Mr. Roos and Congressman Price are admiring the plaques presented to them at a special professional recognition dinner held in East St. Louis on February 23.

LAKE COUNTY CHAPTER held its February meeting on the 20th at Hank's Supper Club in Waukegan. The Chapter members heard a panel discussion on the subject of "Engineers in Industry." Sidney Danoff acted as moderator and the panel members were: J. C. Forney, Director of Personnel, Frank G. Hough Co.; Harold Grubs, Design Engineer for Johnson Motors Co.; Karl Anthony, Assistant to Director of Personnel at Abbott Laboratories, and S. A. Simonson, Plant Managing Engineer at Chicago Hardware Foundry. The panel discussion was followed by a question and answer period. Sixty-one members and guests were present.

BIENNIAL LEGISLATIVE DINNER

The 1957 version of Capital Chapter's Legislative Dinner followed a similar pattern set in former years. Again Past President Klassen was the major-domo in charge of "Vice Presidents". This is one occasion when there are more "Vice Presidents" than members in attendance. The Larsons held forth at the piano and violin and the chorus line was made up of members of the State Department of Public Health. Both pulchritude and glamour were in evidence. A committee of four well known persons judged the community singing.

Most prominent members of the legislature and also several elected officials were in attendance. The meeting was a success from every angle and President Dean Collins and his committee are to be congratulated on a job skillfully planned and engineeringly executed.

Obituary

Lawrence J. Keenan

Lawrence J. Keenan (S '44, N '49), a member of St. Clair Chapter, collapsed while playing golf on March 10 and died a short time later.

Larry, as he was known to his friends, has been connected with Socony Vacuum Company since 1930 and for the past two years has been Plant Engineer.

He graduated with a B.S. in Civil Engineering from Clarkson College at Potsdam, New York. He worked on a St. Lawrence Deep Waterway Survey, later was employed by Detroit Edison for four years before going to East St. Louis.

He was Vice President in 1948 and President of St. Clair Chapter in 1949. He was Chapter Representative of St. Clair Chapter from 1952 to 1956. He served on various State and Chapter committees.

He is survived by his wife and one son. Larry would have been 53 on May 7.

Frank L. Dunavan

Frank L. Dunavan (S '45, N '47), a member of Illinois Valley Chapter, had a heart attack on March 18 and died on March 25.

After graduating from Ottawa Township High School, Mr. Dunavan earned a B.S. in Civil Engineering at the University of Illinois in 1916. After graduation he worked for the C. & A. Railroad and in 1920 was employed by the State Highway Department, where he worked until retirement in 1953. He was a member of Company C, 42nd Engineers, in World War I.

He had been re-elected as Illinois Valley Chapter Representative and had served continuously in that capacity since 1950. Also he served on various other State and Chapter Committees.

Mr. Dunavan is survived by his widow, a son, a daughter, and three grandchildren. He was born on July 14, 1890.

Some Basic Industrial Trends and Their Economic Influence on the Bituminous Coal Industry

By HUBERT E. RISSER*

Presented At Annual Meeting

American Institute of Mining, Metallurgical, and Petroleum Engineers

New Orleans, February 26, 1957

That the bituminous coal industry is far from being the dying industry that many believe it to be is attested by a detailed examination of trends within the industry. Today, coal is in a position to share more fully in America's industrial growth than it has been for many years. In the immediate future its hope lies in further industrial expansion and in increased consumption of coal in its traditional uses. In the more distant future large quantities of coal will probably be converted to other products and consumed as liquid or gaseous fuels, and to some extent as chemicals.

The ultimate consumer buys directly only a relatively small portion of total coal production, but indirectly he buys millions of tons in the form of automobiles, concrete highways, electrical power, and the many other products of modern industry. Any study of the economic aspects of the coal industry must therefore turn to trends within that wide variety of industries and other groups that are the major consumers of coal.

Growth of Population and Industry

The promising position that the coal industry now occupies is the result of a number of basic trends, most of which are related closely to the increasing consumption of goods by our growing population, and to the expansion of plants and facilities to provide these goods.

ABOUT THE AUTHOR

Dr. Risser has been appointed mineral economist to the State Geological Survey and will assume his duties at the Survey on July 1st.

Dr. Risser during the past seven years has been on the faculty of the University of Kansas and holds a bachelor's degree as Engineer of Mines, an M.S. in mining engineering, and a Ph.D. in economics.

Prior to the teaching assignment Dr. Risser served as mine superintendent of the Alabama By-Products Corporation and engineer for the National Safety Council.

During World War II he was a major in the Army Engineering Corps. He is currently active in the Army Reserve Corps in which he is economics officer, Officer of Civil Affairs, Military Government Bank.

Both the population and the production of goods and services within the nation have shown phenomenal increases within the last twenty years.

Population, instead of stabilizing at a level of about 150 million, as had been anticipated by some population authorities, has continued to rise at an increasing rate. Census figures showed the U. S. population in 1950 to be 150.7 million persons, and by 1956 it had increased to an estimated 168 million. This population growth of about 17 million persons in six years was equal to the total increase over the preceding twenty years. Current predictions foresee a population of 178 million in 1960 and in excess of 190 million by 1965.

The expansion in population has been accompanied by a marked increase in the so-called Gross National Product, or GNP, which the annual dollar value of all goods and services produced. The GNP has shown a six-fold increase since 1933, and now exceeds 400 billion dollars per year. During the same period, personal consumption expenditures rose to $2\frac{1}{4}$ times the 1933 level, and the Federal Reserve Board index of industrial production showed a four-fold increase.

Although consumer expenditures and GNP have increased much more rapidly than population, not all of this difference reflects a higher standard of living, since much of it is the result of increased prices. Likewise, the index of industrial production reflects not only an increase in goods available for consumer use, but also the production of capital goods and of goods for government use. Regardless of the use of the product, however, increased activity affects the consumption of coal and other materials in the process.

Increased production of goods has required a parallel increase in the consumption of energy and materials, so that the fuel and raw materials industries have been directly affected. Some such industries have expanded as much as or more than their customers, but others, like coal, have barely held their own. Had the use of coal increased at the same rate as industrial production, coal production would have risen from 310 million tons in 1933 to about a billion tons per year in 1956. Instead, only about one-half billion tons were produced.

Although the coal industry's expansion failed to equal the general industrial growth of the nation, coal nevertheless has been strongly affected by the trend. In non-competitive uses of coal, industrial expansion caused direct increases in coal consumption. In competitive

*Member of AIME, assistant professor of mining engineering at the University of Kansas, and mineral economist for the Kansas Geological Survey.

uses where coal has enjoyed special advantages, its use has also fairly closely paralleled the expansion. In competitive uses where coal has lost large markets, the losses undoubtedly would have been even greater had not the consumer industries been expanding.

Expanded use of competitive fuels has been one major cause for coal's failure to parallel the nation's growth. Present consumption of fuel oil for heating and industrial purposes is almost four times that of twenty years ago, and there has been an almost equal increase in the use of natural gas for the same purposes. In some competitive uses oil and gas have supplanted coal because of convenience or cleanliness in their use; in other uses cost has been the determining factor.

A second reason for the decline in the consumption of coal is increased efficiency in its use. Most efficient use of coal is obtained in large units where close combustion control is possible, and where operations can be mechanized. Large utility plants provide a good example. Consumption of coal in such plants has dropped from an average of 1.46 pounds per kilowatt hour produced in 1933 to only 0.95 pounds today. New plants are using 0.75 pounds or less. Improved efficiency has in some instances reduced the amount of coal required to perform a given service, and has undoubtedly retained for coal some markets which otherwise would have been lost.

Some Basic Trends

The pattern of consumption of coal has shown many changes over recent years. In some uses gas and oil have largely supplanted coal as fuel. This is especially true in railroads, and in domestic and commercial heating, which once constituted the major markets for coal. Fortunately for coal, the decline in these uses has now been offset by increased consumption in other uses, resulting from the general expansion of our economy. Trends in the general activity and the use of coal by major consuming groups give an insight into what is happening to the coal industry.

Railroads

One of the traditional consumers of coal has been the railroad industry. Twenty years ago it consumed about 20 percent of total coal production; today it consumes about 2 percent. This is the result of trends in railroad activity as well as in the use of the fuels.

The railroads of the nation have failed to share proportionately in the expansion that has occurred in general industrial activity through recent decades, due primarily to competition from other forms of transportation. With more than a four-fold increase in industrial activity, railroad activity, as measured by freight carloadings, is only slightly more than 50 percent above the 1933 level.

Railroads have reduced drastically their consumption of coal. In 1933, Class 1 railroads used 73 million tons of coal; the current rate is about 12 million. During

World War II the greatly increased activity of the railroads caused a large increase in the consumption of coal. From a peak of 132 million tons in 1944, consumption fell steadily and rapidly to its present level.

Most of the reduction in the use of coal has been due to a rapid change-over from steam to diesel locomotives. The following figures on fuel consumption illustrate the rapidity with which this change has taken place.

TABLE 1. FUEL CONSUMPTION BY RAILROADS*

Year	Tons of coal (Thousands)	Barrels of fuel oil (Thousands)	Gallons of diesel fuel (Millions)
1940.....	90,726	65,198	81
1945.....	124,220	111,966	454
1950.....	65,855	60,386	1,979
1955.....	15,913	14,873	3,535
1956.....	12,921	10,713	3,706

*Source: Interstate Commerce Commission.

Further dieselization will very likely take place and probably will reduce railroad consumption of coal to a still lower level. However, with such use now constituting only 2 percent of total coal consumption, the overall effect on the coal industry will be small. Furthermore, it may be that the perfection of a coal-fired gas-turbine locomotive now under tests will enable coal to regain some of the lost railroad markets.

Retail Consumption

A second category in which coal consumption has been declining is in what is classified as "Retail Deliveries." This category includes domestic consumption and consumption by commercial concerns. Presumably, the amount of fuel in retail use would be governed largely by the size of the population.

From 123 million persons in 1930, our population has increased to an estimated 168 million. Despite this one-third increase in population, retail deliveries of coal declined from 80 million tons in 1933 to less than 50 million tons in 1956, roughly a 40 percent drop, reflecting the increasing inroads made by gas and fuel oil.

A further increase in population can be anticipated and this will mean a steady increase in the consumption of fuel for domestic heating, I believe, however, that it will be some time before this increase has any appreciable effect on the retail consumption of coal.

Natural gas, because of its convenience and cleanliness, is highly preferred for domestic and commercial heating. Consequently, it can command a premium price for these uses as compared to ordinary industrial uses, and there is the trend toward diverting gas from industrial to retail uses wherever possible. This is being accomplished by underground storage of natural gas near centers of population so that it will be available when needed.

Steel

Exclusive of coking coal, the steel industry also uses moderate quantities of coal for other purposes, primarily for the generation of gas and steam. A gradual transition to oil and natural gas has reduced the consumption of coal for these uses.

Although steel production has been rising, coal consumption by the steel industry (exclusive of coking coal) has been gradually decreasing. In 1933, the steel industry produced 45.6 million tons of ingots for steel and castings, and consumed 10 million tons of coal. In 1956, steel production was approximately 115 million tons and the consumption of coal was about 5 million tons.

It appears that even the large expansion in steel capacity now planned will probably be insufficient to offset this downward trend. However, since the use of coal by the steel industry accounts for only one percent of total production, a further decline will have but little effect on the over-all picture.

Electric Power

Twenty years ago electric power utilities ranked fifth among the seven major classes of coal consumers. Today it ranks first, and accounts for more than one-third of all the coal consumed within the United States.

The growth of electric power has exceeded that of nearly all other major segments of the economy. From 81.7 billion kilowatt hours in 1933, electric utility output rose to 546.4 billion in 1955 and an estimated 600 billion in 1956. This amounts to more than a seven-fold increase in 23 years. Comparison of this increase with a four-fold expansion in industrial activity, and a one-third increase in population during the same period provides some concept of the growth of the industry.

The steady growth in electric power generation has required increasing amounts of coal. While power production increased to seven times its 1933 rate, coal consumption by utilities increased six times. From 27.1 million tons in 1933, coal consumption by this industry has grown until, in 1956, it reached an estimated 155 million tons. That the expansion in coal use did not parallel that of electric power output even more closely can be attributed to improved efficiency in coal combustion, to some increased production of hydro-electric power, and to increased use of oil and natural gas. In areas where natural gas is readily available its use for utility and industrial use has expanded rapidly through application of the industrial-interruptible type of contract. With further development of underground storage, the availability of gas for such uses will probably disappear.

Current estimates predict an increase in power production from the current rate of 600 billion kilowatt hours to an annual rate of 754.5 billion in 1960, and 956.5 billion in 1965. Such an output as that suggested for 1960 would probably require more than 190 million tons of coal.

What impact the use of nuclear energy for the generation of electric power will have on the coal industry cannot be predicted with any assurance at present. Although most authorities agree that the use of such power is still some years off, there is no complete accord on how long it actually will be before its effects are felt by coal producers. The general estimate is that it will be at least 20 years before it becomes significant, at least in the United States. In other countries where ordinary fuels are less plentiful and more expensive, progress may be at a somewhat faster rate. A report published late in 1956 indicated that power units now planned in the U. S. for completion by 1960 will have a total capacity of 556,000 KW, and those to be completed by 1962 will have an aggregate capacity of 1,126,500 KW.

Coke

Coke plants currently are the second largest consumers of coal. Because a large portion of the coke manufactured each year is used to produce pig iron, activity in the coke industry closely parallels that in the iron and steel industry.

Pig iron and steel production in 1956 were approximately five times their 1933 level. Coal used to produce coke rose from 40 million in 1933 to about 105 million tons in 1956—somewhat less than a three-fold increase. Coke production would have paralleled pig iron production even more closely had there not been a decline in the use of coke for other purposes. About one-third of the coke produced in 1933 went for other uses; in 1956 it was about one-fifth.

The present capacity of the steel industry is about 128 million tons per year, and new construction now planned will increase the capacity to about 143 million tons by 1959. Such an increase, if fully utilized, can increase consumption of coal by millions of tons. However, certain factors may tend to offset the increase to some extent. For one thing, the ratio of scrap iron to pig iron used in the furnace charge can be varied. An increase in the proportion of scrap will reduce the amount of pig iron required and in turn the amount of coke needed. Secondly, the amount of coke consumed in producing a ton of pig iron is being gradually reduced. Other possible methods of reducing the amount of coke used to produce steel would be extensive use of high top pressures, or of the low-temperature direct reduction of iron ore.

Cement

The tremendous expansion in private and public construction since World War II is well known. Directly related to this is the steady and rapid growth of the cement industry. Cement production increased from 64 million barrels in 1933 to about 350 million barrels in 1956, or 5½ times the earlier figure. Coal consumption by the industry meanwhile has increased more than three-fold and is currently about 9.3 million tons per year. This amount is slightly less than 2 percent of total coal production. The expansion of the

industry currently planned will bring some increase in the use of coal.

Other Industrials

Industries other than the specific industries discussed above are grouped within a consumer class designated as "Other Industrials." The general index of industrial production should rather closely parallel activity within the group. Industrial production in 1956 as shown by the index was four times that of 1933. Coal consumption by this group increased only 15 percent during this period. As a matter of fact, comparison of present consumption with more recent years shows a considerable decline rather than any increase. This has been caused by a steady replacement of coal by other fuels.

There may be some further decline in the use of coal by other industrials, but the trend seems to be leveling off. It appears that some of the natural gas now going to such industries will before long probably be diverted to retail consumers through use of the underground storage facilities being developed.

Net Effects of the Trends

To a large extent changes in consumption by the seven major consumer classes discussed previously have tended to counteract each other (Fig. 1). While con-

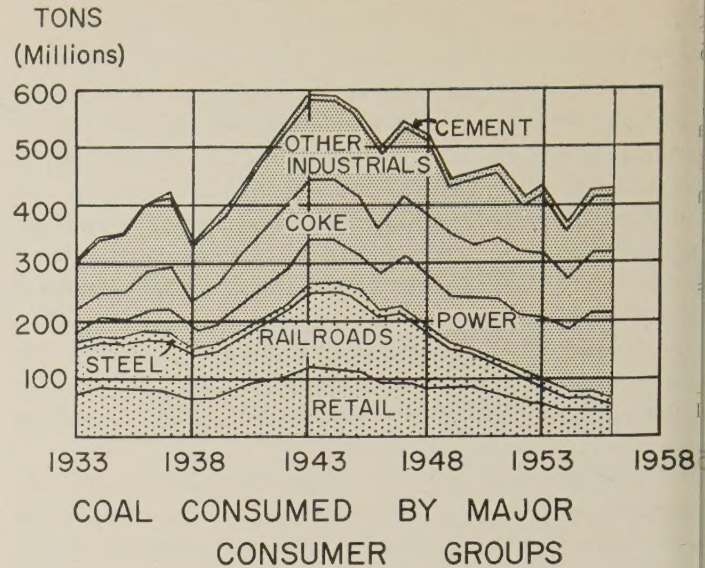
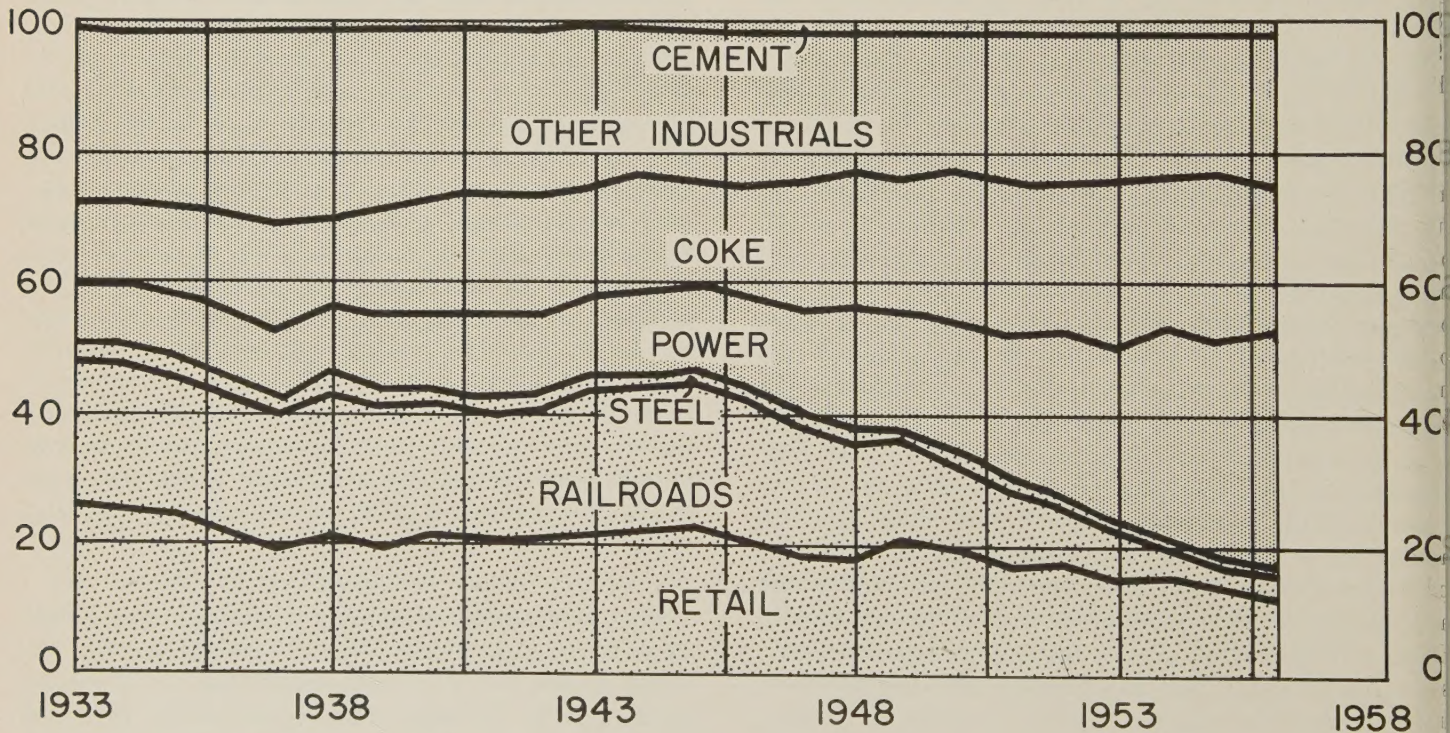


Fig. 1. Coal consumed by major consumer groups.

sumption of coal in railroads, steel, and retail uses has been declining, its consumption in coke, cement, electric power, and other industrials has been growing. The magnitude of the gains during World War II, and losses since then, tend to obscure the fact that aggregate consumption by the seven classes has been trending

PERCENT



PERCENT

PERCENT OF TOTAL COAL CONSUMED BY
MAJOR CONSUMER GROUPS

upward over the long run, and that there has been a 35 percent gain since 1933.

Among the most important outcomes of the trends have been the changes in relative importance of the different classes, as consumers of coal (Fig. 2). These changes are shown in the tabulation.

TABLE 2. TRENDS IN COAL CONSUMPTION

Industry	Coal consumption (percentage)	
	1933	1956
(Those of declining consumption)		
Railroads.....	23.0	2.9
Retail.....	25.5	11.5
Steel.....	3.2	1.2
	51.7	15.6
(Those of increasing consumption)		
Power.....	8.6	35.7
Coke.....	12.4	24.4
Cement.....	0.9	2.2
Other Industrials*.....	26.4	22.1
	48.3	84.4

*It should be noted that the *percentage* represented by "Other Industrials" declined, but the *actual tonnage* in 1956 showed an increase over 1933.

The three classes which consumed 51.7 percent of the total in 1933 had declined to 15.6 percent in 1956. Over the same period the other four classes, consuming 48.3 percent in 1933 had increased to 84.4 percent in 1956. In 1956, three classes accounted for 82 percent of the total.

With these industrial classes accounting for so large a percentage of coal consumption, the coal industry is in an extremely favorable position to gain by any further expansion of our economy. Conversely, it must be added that the coal industry is in an extremely vulnerable position should any decline, or even a leveling off of industrial activity, take place. From this standpoint, I believe the trends of the next twelve to eighteen months may be especially significant, and should be carefully watched by the coal industry.

Foreign Trends

Since the conclusion of World War II there has been a vast rebuilding and expansion of Europe's industrial production, requiring large quantities of coal. British and European coal mines have not been able to supply this coal in adequate quantities at suitable prices. Consequently, United States coal is being shipped abroad in increasing quantities.

Foreign exports of coal in 1956 amounted to 48 million tons. Current predictions are for an increase to about 56 million tons in 1957, and a steady growth in coal exports for some years to come. However, the unsettled conditions prevailing throughout the world make the future of export trade very uncertain. Future

estimates under such conditions can be hardly more than guesses.

On this side of the Atlantic, the growth of the Canadian steel industry may further increase our shipment of coal to that country.

Long-Term Trends

A comment was made earlier about the long-range future for coal. The promise for the distant future lies in the predicted need for energy sources of all forms. In a recent study made jointly by the U. S. Bureau of Mines and Bituminous Coal Research, Incorporated, the following projections of energy use were given:

Year	Energy equivalent in millions of tons of coal
1960.....	1,779
1965.....	1,990
1970.....	2,238
1975.....	2,530
1980.....	2,863

No prediction is made as to how much of the total energy will be provided by coal or by any other particular fuel.

Should bituminous coal retain its present share of 30 percent of the total energy produced, projected consumption of coal would be:

Year	Millions of tons of coal
1960.....	533
1965.....	597
1970.....	671
1975.....	759
1980.....	859

The largest U. S. consumption on record was the 593 million tons used in 1943. According to the foregoing estimates, this peak should be reached again in less than ten years—and this time without a war effort as its cause.

If the projected expansion in energy use does occur, it appears likely that the proportion supplied by coal will steadily increase. However, in the years to come it is likely that the greatest expansion in coal use will be in its conversion to liquid and gaseous fuels. The oil and gas industries have built up a tremendous demand for their products—a demand which some day must be at least partially satisfied by synthetic liquid and gaseous fuels produced from coal, oil shale, and bituminous or oil sands. The higher costs of processing coal to provide these products will be offset at least to some extent by the fact that coal occurs near the major markets, whereas the products of oil shale must be shipped from Colorado or other western locations. Many factors will enter into the determination of when such conversion will be economically feasible. It has been

predicted, however, that within 15 or 20 years inadequate supplies of other liquid and gaseous fuels will force us to it. To supply only 5 percent of the 1952 demand for natural gas and natural petroleum would have required more than 100 million tons of coal.

Another potential use for important quantities of coal is the manufacture of chemicals. In the past, coal chemicals have been almost entirely by-products of coke production and, therefore, were directly tied to coke requirements. New plants now are in operation for the purpose of producing chemicals directly from coal. At least one of these plants operates in close connection with a large fuel-burning installation which can make use of the char which is formed.

The prospects of such an industry depend almost entirely upon the extent to which markets for the products exist or can be developed, and upon how well coal can compete with other producers.

Summary

In summary, competitive fuels have replaced coal to such an extent in some of its traditional uses that present consumption in these industries is only a small fraction of its former volume. Meanwhile, expanded use in other fields, due to the nation's industrial growth, has reached a point where it has more than offset the

declines. With use in declining markets constituting only a very minor part of total consumption, coal is in an excellent position to benefit from further industrial expansion of the nation.

With the present consumption pattern, coal's future is tied more closely to industrial activity than ever before. This puts it in a position to share more fully in future growth of industry, but at the same time makes it more vulnerable in case of an economic recession. Present trends indicate a continued growth both in population and industrial activity, and to provide a portion of the energy for this growth, coal production will expand.

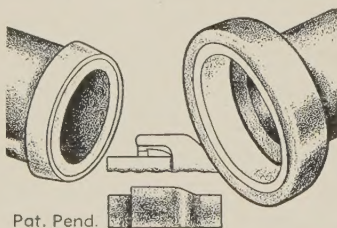
For the immediate future coal will be used in the traditional manner and in its natural form. To supply an increasing share of energy demand in the more distant future, coal will be converted to liquid and gaseous fuels. Some will also be converted to chemicals to fulfill a growing need for such products.

There will, no doubt, be interruptions in coal's progress and very likely some periods of decline, but if we are to assume that our nation will continue to grow and advance, that our population will increase, and that our standard of living will improve, then, I believe we are justified today in saying that coal's future has never looked brighter.

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NEWS OF THE CHAPTERS

CENTRAL ILLINOIS CHAPTER held its March meeting on the first day of spring, March 21, and heard a talk by Captain James E. Cohn, Office of Naval Research, on the subject of "Polar Operations of the U. S. Navy." The meeting was held in the Tunnel Room of the St. Nicholas Hotel. Central Illinois Chapter has followed the pattern set by several other Chapters of conducting its business by its Chapter Board of Direction. Two meetings of this body were held during March.

CHICAGO CHAPTER held its March meeting on the 14th at the Chicago Engineers Club with 48 members and guests present. Paul H. Robbins, Executive Director of NSPE talked on the professional aspects of the National Society. His talk was followed by a short question and answer period.

JOLIET CHAPTER held a joint meeting on March 25 with the Louis Joliet Chapter No. 104 of the American Society of Tool Engineers. The ASTE was celebrating its 25th anniversary. President Robert Brown of the Joliet Chapter talked on the subject "Tooling for Tomorrow," and the members present participated in a special closed circuit broadcast from Houston, Texas, which was a simultaneous hookup with 140 chapters throughout the United States and Canada. Meetings of this kind are the highest type of unified thinking among all engineers.

A story from Army life tells about the sergeant working through a hot afternoon with a listless platoon. Finally he called a halt and said, "You guys think you're soldiers? I've seen better drilling by little cans of beer on my television!"—*Cincinnati Enquirer*.

"Two!" shouted the pint-sized umpire.

"Two what?" snarled the big catcher.

"Yeah, two what?" echoed the equally large batter.

"Too close to tell," said the umpire.—*News and Views*.

The remarkable thing about college reunions is your classmates have gotten so stout and bald they hardly recognize you.—*Franklin P. Jones*.

"It probably would be all right if we'd love our neighbors as ourselves," a man on the bus remarked this morning, "but I wonder if they could stand that much affection."—*Burton Hillis*.

A woman reported the disappearance of her husband to the police.

"Is there any message you may wish to give your husband if we find him?"

"Yes," she replied eagerly, "tell him mother didn't come after all."—*Automotive Dealer News*.

EMBRYO ENGINEERS' INVENTORY

The report from the Office of Education on earned degrees in the academic year 1955-56 in comparison with that of 1954-55 is of considerable interest, since during the past two years much has been written and said about the shortage of engineers. The statistical material below is from Engineering and Scientific Manpower newsletter. If the same percentage graduates in 1960 compared with those graduating in 1956 (who began in 1952), then the engineering positions will nearly balance with the jobs offered. However, with industry demanding an increasingly larger number of engineers per worker, there will be fewer engineers than there are jobs to fill for at least five years. What happens after that is anybody's guess.

ENGINEERING DEGREES

1955-56		1954-55
26,306	B.S.	22,589
4,705	M.S.	4,379
610	Ph.D.	599
1956-57	Enrollments	1955-56
77,738	1st Year	72,825
55,676	2nd Year	50,841
44,610	3rd Year	39,377
37,571	4th Year	31,300
1,387	5th Year regular	1,358
1,838	5th Year cooperative	1,450
32,210	Other	24,297
251,121	Sub-total	221,448
22,529	M.S. graduate students	18,482
3,402	Ph.D. graduate students	3,163
277,052	Total	243,093

A four-year-old boy was told a story about a little boy who had an exciting adventure. When the story was finished, he asked, "But where was the boy's mother?"

"The story didn't mention his mother," the storyteller said. "Perhaps his mother was dead."

Concluded the small boy: "I'll bet she was killed in a nervous wreck."—*Dixie Roto Magazine*.

"Sin" is a word rapidly becoming obsolete. It is now called "experience."—*Frances Rodman*.

Time was when it was only Washington's face that was on our money. Now it's Washington's hands on it as well.—*Armstrong Tire News*.

Etiquette is what makes it OK to watch the intimate family comedy on television, but impolite to catch the even better one thru the picture window of the house next door.—*Hartford Courant*.

It has been suggested that the trouble with each generation is that it hasn't read the minutes of the last meeting.—*The Crusader*.

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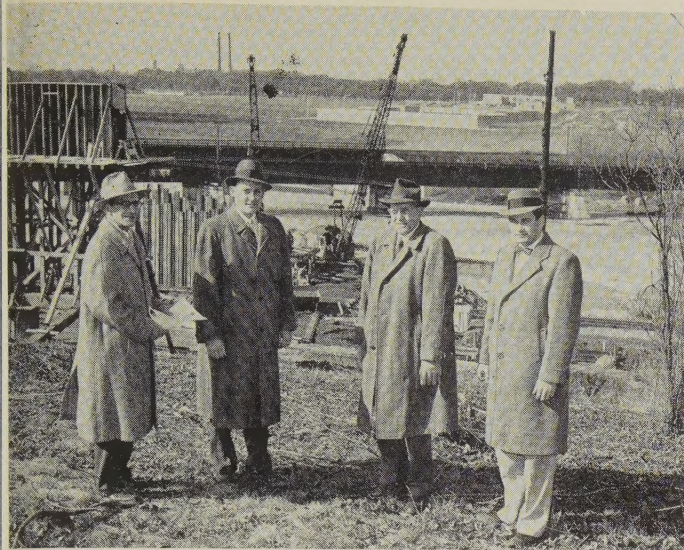
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DuKane Chapter inspects Illinois State Route 20 bypass bridge near Elgin. Left to right: Wm. A. Gavelek, Elgin; James E. Scott, Vice President, DuKane Chapter; D. S. Magowan, President, DuKane Chapter; Calvin G. Brown, Elgin City Engineer.

ROCK RIVER CHAPTER personals: Ossie Langfelder will start work in Springfield April 15 for Crawford, Murphy and Tilly. G. S. McDonald is the new Engineer of Construction at the highway department. Congratulations, "Mac." The Bill Byers' have moved to Champaign where Bill is assigned with Clark and Daily. Bob Griffin and family recently made the trip from St. Louis to visit friends in Dixon over the weekend.

WEST CENTRAL CHAPTER held its March meeting on the 27th at the Kewanee Hotel, Kewanee. Dr. Max Suter, who is in charge of the Peoria installation of the Illinois State Water Survey ground water studies, gave a talk on "Water Resources Problems." His talk was illustrated with slides. Among the guests were three ladies representing the Kewanee Water Department and the League of Women Voters.

Thirty years from now parents will be telling their children what tough times they had as kids walking 100 yards to the nearest school bus stop, instead of leaving the front steps by helicopter.—*Grit*.

Of the sounds the human ear cannot hear, it is a sad fact that none are made by the human tongue.—*Banking*.

A fellow looked away from the wrestling matches long enough to notice that his wife was busily knitting a tiny garment.

"Why, Honey," he exclaimed, "why didn't you tell me?"

"Calm yourself, Buster," said the little woman, "I'm knitting myself a new bathing suit."—*Seng Fellowship News*.

BOOKS

Engineering and Technical Handbook by McNeese and Hoag, Prentice-Hall, Inc., Englewood Cliffs, N. J. Publishers. 376 pages. Textbook edition, \$4.95.

This is a reference and handbook which provides a comprehensive set of formulae, principles and tables in an inexpensive book of convenient size—5 inches by 8 inches.

Part I enumerates the basic principles of engineering and physics from absolute zero to Young's Modulus. Part II gives a tabulation of the properties of materials in 26 tables beginning with atomic weights and ending with Horton's value of n . Part III consists of equivalents and conversions. Part IV condenses the basic principles of mathematics from arithmetic to integral calculus into 41 pages. Part V gives mathematical tables. Included in the book is a Greek letter alphabet and a table giving the abbreviations for scientific and engineering terms, for example, a hyperbolic cosine is cosh.

This handbook should be a welcome addition to both the library and the drawing board. If your book store does not have a copy, The Illini Union Bookstore, 715 S. Wright Street, Champaign, Illinois has a supply and will accept mail orders.

Willie arrived home with two black eyes.

"Fighting again!" said his mother. "Didn't I tell you that when you are angry you should count a hundred before you do anything?"

"Yes, I know," returned Willie, "but the other boy's mother told him only to count fifty."—*Tid-Bits*, London.

There was a sad incident one day in the heart of the Ozark Mountains. A farmer's mule kicked his mother-in-law to death. A tremendous crowd turned out for the funeral, but it was made up almost entirely of men. The minister commented, "This old lady must have been mighty popular because so many people will leave their work to come to her funeral."

"They're not here for the funeral," explained the farmer. "They're here to buy the mule."—*Krohler News*.

Chairman addressing an audience: "Our guest speaker has fallen asleep. The motion has been made, seconded, and carried unanimously that we do not awaken him."—*Inn Dixie*.

I hold every man a debtor to his profession;
from the which as men of course do seek to receive
countenance and profit, so ought they of duty
to endeavor themselves by way of amends
to be a help and ornament thereunto.

Sir Francis Bacon

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